Vol.XIII No.3 March 1984 Second class postage paid at Dallas, Texas. Postal identification statement, page 2

Published by Jim Cranshaw, N5FSL Monthly except July and August

Price: $8.50 yearly Single issue $1.00

THE HORN SPEAKER

THE NEWPAPER FOR THE HOBBYIST OF VINTAGE ELECTRONICS AND SOUND

Popular Radio

VOLUME I JUNE, 1922 NUMBER 2

Running Down Law Breakers *by* Radio

By FRED C. KELLY

THE radio was first used—and used successfully—for running down criminals as far back as 1902, only ten years after Sir William Crookes made the astounding announcement to the skeptical world: "Here is revealed the bewildering possibility of telegraphy without wires, posts, cables or any of our present costly appliances."

The significant police message was sent from Avalon, on the Island of Catalina, to San Pedro, on the mainland of California—towns which at that time had communication with each other only by slow mail steamers. The message announced that two colored thieves were about to land with their loot from a vessel which was specified.

The two thieves were arrested on the gangplank.

Between that elementary step and the most recent development of the radio in transmitting fingerprints and photographs of malefactors (a sort of long range Bertillon system of identification employed by the French government), a vast amount of experimenting has been done. Yet the uses of the radio by the police are only barely beginning.

The Police Department of New York has equipped its police boats and is at present equipping its airplanes with radio apparatus.

The Police Department of Chicago is experimenting with direct communication between headquarters and its patrolmen on their posts.

The Police Department of Boston is broadcasting warnings every evening as a regular part of its daily routine.

And some of the most interesting uses of the radio in rounding up crooks by radio are now being worked out by the police of our smaller cities and towns, as is here told by a war-time official of the United States Secret Service and a well-known authority on detective methods.

—EDITOR

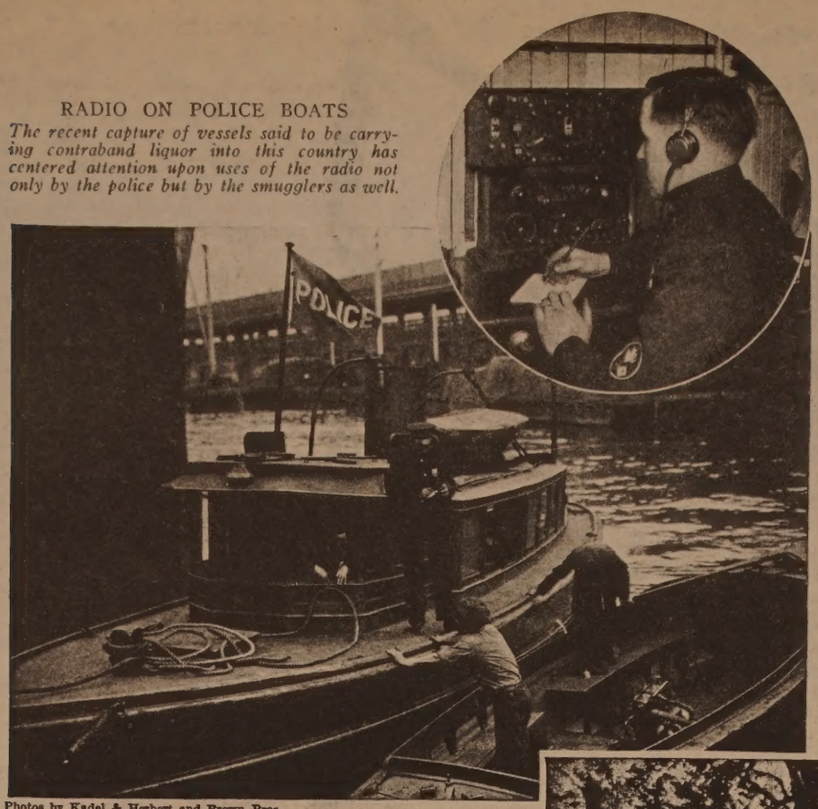
IF there is one thing I dote on it is crime. Though I have never taken an active interest in perpetrating crime myself, I like to know the mental processes of those who do. A burglar friend once told me of a scheme he had used for ascertaining if a family is temporarily away from home. He placed a small thin leaf in the keyhole of the front door and returned two days later to note results. If the leaf had been crushed by the inserting of a key in the lock, he would then know that the house was not deserted. But if the leaf was undisturbed, he intended to take a chance and break in. After hearing of this, I went to a police sergeant acquaintance to learn of police methods for protecting homes when the family is absent. He told me of various systems of burglar alarms, and the care required to have wires for such apparatus either buried or beyond the reach of anyone who might desire to cut them.

It is a fascinating battle of wits between those who are trying to enforce the law and those who would break it. In many respects the criminal has the advantage. He knows his own plans and also knows in a general way the working methods of the police, while the police know nothing of projects that a criminal may have in his head. Before a burglar enters a house, he finds out when the policeman patroling that beat is most likely to be somewhere else. But the policeman cannot plan definitely how to outwit the burglar because he doesn't even know that the burglar is going to be there. If he knew as much about the burglar's plans as the burglar does about *his*, his job would be easy enough. The best the police can do is to have a system so broad and sweeping that it will discourage crime wherever or however planned. This system is at times startlingly effective—and radio telephones are going to make it even more so.

On a small boat lying at anchor in New York harbor one night, a man became obstreperous and threatened to shoot the captain and others. He was so troublesome that several aboard almost wished he were somewhere else. Finally the captain told him that if he didn't behave himself, they would send for a policeman and

RADIO ON POLICE BOATS

The recent capture of vessels said to be carrying contraband liquor into this country has centered attention upon uses of the radio not only by the police but by the smugglers as well.



Photos by Kadel & Herbert and Brown Bros.

of summoning a policeman out there in the middle of the bay struck the trouble-maker as highly amusing, and he laughed heartily. A raucous, sneering laugh it was, like an old-fashioned stage villain.

But the situation wasn't so funny as he thought. In a few minutes a New York policeman stepped aboard and took the fellow in charge. The captain had 'phoned by radio to police headquarters and a message had been sent from there to the police launch which was less than half a mile from the disorderly man.

The New York police department is about to add other patrol launches, each equipped with radio receiving apparatus, and criminals who seek to go down to the sea in ships may have many a plan upset. Scores of messages are telephoned to New York police headquarters each day from incoming and outgoing ships. I give elsewhere a few samples of these selected at random. Even so personal an enterprise as committing suicide is going to be more and more difficult.

Those not familiar with metropolitan police methods may be disappointed that radio telephones have not worked a greater revolution in means of communication between headquarters and men on the street. The one drawback to radio talk between policemen is lack of privacy. If a sergeant at central office should 'phone to an outlying precinct station to send reserves to Madison Square Garden because of a possible riot, and this message were picked up by amateurs, within half an hour the bystanders on hand at Madison Square Garden to witness the excitement might number about 2,000,000.

Central News Service

COULD YOU IDENTIFY THESE MEN?

This is what a photograph looks like after it has been transmitted over the Belin machine. The police of France are experimenting with this method of long-range identification.

Moreover, even the old-fashioned telephone system has bigger possibilities than is generally understood. I sat one night talking with the desk sergeant in a precinct station when he received a message about an attempted burglary that he desired to give to Patrolman Potts, then strolling about his beat.

"I'll call Potts to the 'phone," remarked the sergeant, and he pressed a button. Four minutes later Patrolman Potts rang up from a police call box on a street corner, and inquired what was wanted.

The man at the desk had switched on a signal in a street lamp-post. This signal consisted of a green light—two short flashes, repeated every four seconds until it brought an answer. When several policemen are on the same beat, there might be a different signal for each individual. The usual plan, I believe, is for one patrolman to be designated to watch for the signal and then carry the message to the fellow-officer who is wanted.

If, instead of a wire 'phone system the message were sent by radio, the result might be much the same.

Radio receiving apparatus small enough for a man to carry in his pocket has been perfected. But it is necessary to wear a headgear with receivers over the ears and if all policemen wore these as they walked about the streets they might receive radio messages, but might fail to hear much else. For the present, police radio messages are likely to be sent only to regular receiving stations, placed at strategic points, and the chances are that it will be some time before patrolmen regularly receive orders as they pace about their beats. But already in use in Chicago is a police automobile equipped with both receiving and sending apparatus. While there is the handicap already mentioned that the messages lack privacy, this outfit has distinct possibilities. With it a policeman could chase an automobile thief or a murderer and report progress to his chief, ask for further orders, or have other pursuers sent in another direction. The trouble is, though, that a straightaway long distance chase between a criminal and a policeman is a rare occurrence. We see such things in moving pictures but rarely anywhere else. The difficulty about catching a criminal is that one usually doesn't know which direction he took. Hence, the only way to catch him is to notify people in *all* directions to look for him. This is where the greatest use of radio telephones for thief catching seems likely to be—broadcasting descriptions and other information from the police of one town to another and to the public.

With the number of private radio receiving outfits likely to be in use a year from now, an escaping criminal would not feel safe in approaching any farmhouse for food or shelter, no matter how obscure the lane on which it is located. Robert Fay, the German agent who made a marvellously ingenious escape from Atlanta penitentiary and got to Spain before he was captured, once told me how he never went to a farm house for food until he had first made certain that no telephone wires entered it. Absence of telephone wires will no longer give an escaping criminal safety.

I once asked a famous New York criminal what he would do if he suddenly found it necessary to disappear from his ordinary haunts and keep in hiding for several months without danger of being traced.

POSTAL IDENTIFICATION STATEMENT The Horn Speaker (USPS 956120) is published monthly, except July and August by Jim Cranshaw, N5FSL, 9820 Silver Meadow Drive, Dallas, Texas 75217. Subscription rates are $8.50 per year, $15.00 for two years. Second class postage paid at Dallas, Texas. POSTMASTER: SEND ADDRESS CHANGES TO MAIL ADDRESS: THE HORN SPEAKER, P. O. BOX 53012, DALLAS, TX 75253-0012.
(ISSN 2537-1430)

"I'd take a lower berth from New York to Canada," he replied, "and when I got well up into the woods, I'd open the window in my berth at some little siding or small way station and drop off the train unobserved. I probably could stay about there in the woods, at farm houses and small villages for a long time before it would occur to people that I was anybody in particular. Few of the natives in such outlying places have telephones or bother to read the newspapers."

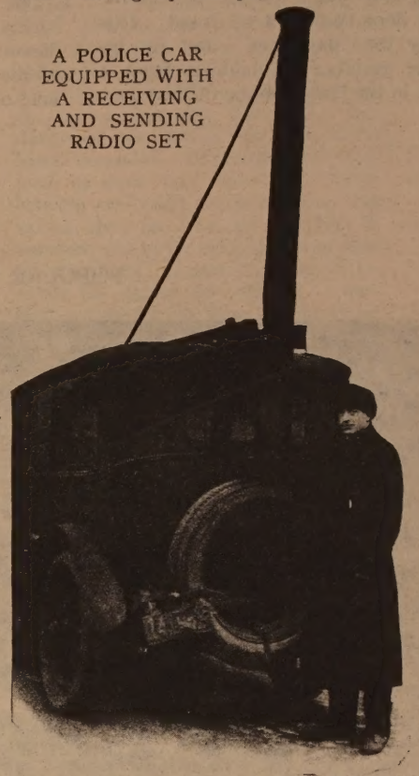
There are a number of flaws in this scheme that I need not go into here. But the main point is that when nearly all the country people have radio receiving outfits, as seems likely to happen, there won't be any more outlying points.

The greatest weakness in our police system is that it is local rather than national. There is surprisingly little systematic co-operation between the police of different cities. They are willing enough to help each other, but are poorly organized to do so. If a clever forger victimizes banks in Detroit, then in Cleveland, it should not be difficult for the police in Pittsburgh or Buffalo to figure out that he is evidently working eastward. But they probably never know this until too late. Radio broadcasting of such information should help to unify police work over a wider area.

One of the first cities to seize the opportunities offered by radio 'phones for police work was Dallas, Texas. This was the result of a letter to the Dallas police department from Frank M. Corlett, manager of a Texas division of The American Radio Relay League, the big national organization of amateur radio operators. Corlett proposed that the local police broadcast such information as they wished to make public about crime, and let amateurs throughout Texas and adjoining states turn this over to the police or constables of their communities. As the police department had no radio apparatus at that time, the broadcasting was done at first by Mr. Corlett. After the value of the plan was proved, the city bought apparatus for the police department. The station has ordinarily a range of 200 miles in day time and 500 miles at night. Messages have been heard as far away as North Dakota and California. Louis W. Turley, the Dallas police and fire commissioner, declares that one capture which resulted more than paid for the installation of the apparatus. By way of rewarding the amateurs who receive their messages and co-operate with them, the Dallas police not only send out crime reports, but furnish a complete daily entertainment—concerts, news of sports, sermons, lectures, and other features. So far as I know this is the only municipally-owned radio outfit that furnishes such service and is probably the first time on record where a police department has ever made itself so entertaining as well as useful.

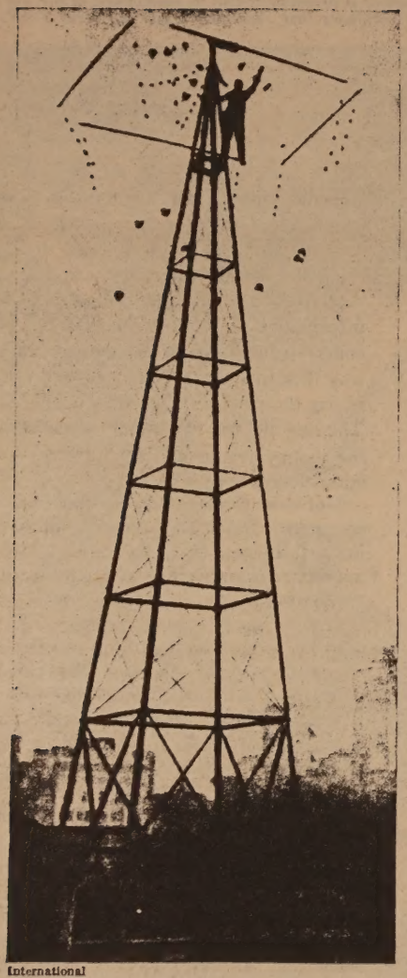
An important feature of the radio as applied to the running down of crooks is the chance it gives to the radio amateur to take part in the capture of the fugitives. One of the most spectacular of these incidents occurred recently on a payday in the small town of Crafton, Pa. The doors of the First National Bank had been open half an hour and the employees were making up the payroll for some

A POLICE CAR EQUIPPED WITH A RECEIVING AND SENDING RADIO SET



International

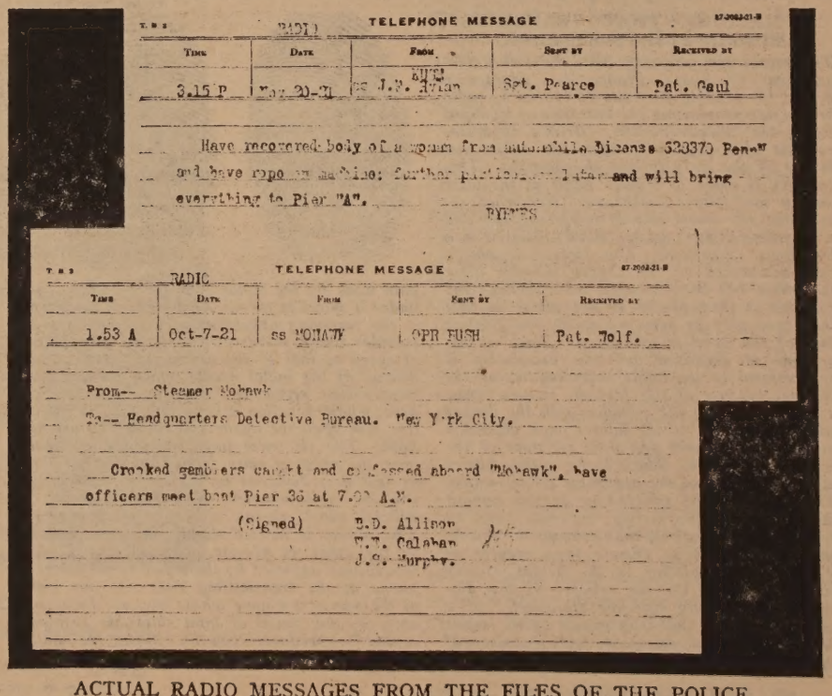
That the radio apparatus installed on this police car is no toy is indicated by the size of the resonance coil that is supported by an especially built framwork.



International

THE AERIAL OVER THE POLICE HEADQUARTERS OF CHICAGO

During the past few months experiments have been carried on in Chicago by George E. Carlson, of the Department of Gas and Electricity, for keeping police headquarters in constant touch with its patrolmen by means of the radiophone. The experiments are significant in that they anticipate what will probably be a highly valuable application of wireless. This picture shows the aerial located on the roof of the Chicago City Hall, in which the police headquarters are located.



TELEPHONE MESSAGE

Time	Date	From	Sent by	Received by
3.15 P	May 20-21	ss J.W. Allan	Sgt. Pearce	Pat. Gaul

Have recovered body of a woman from automobile license 523370 Penn[illegible] and have rope on machine; further particulars later and will bring everything to Pier "A".

PIERCE

TELEPHONE MESSAGE

Time	Date	From	Sent by	Received by
1.53 A	Oct-7-21	ss MOHAWK	OPR PUSH	Pat. Wolf.

From-- Steamer Mohawk

To-- Headquarters Detective Bureau. New York City.

Crooked gamblers caught and confessed aboard "Mohawk", have officers meet boat Pier 36 at 7.00 A.M.

(Signed) E.D. Allison
W.T. Calahan
J.S. Murphy.

ACTUAL RADIO MESSAGES FROM THE FILES OF THE POLICE DEPARTMENT

twenty firms, when a car drove up outside and stopped. In the car were five men, including the driver. Quickly four of them entered the bank and drew the blinds, while the fifth remained seated in the car.

"No funny business now," warned the leader of the visitors. "We want that money."

The employees of the bank were driven into the vault, at the point of the revolver, but as the teller went in he succeeded in throwing the safety switch so that the air-tight door could not be closed. This left only the "day door"—and for his pains he received a clubbing from a revolver in the hands of one of the men.

The assistant cashier was standing at a cabinet examining a note when the men entered. On the window sill near him was a pistol. He started to reach for it.

"Get that guy," one of the robbers yelled.

The cashier darted for the weapon, but a bullet reached him. He was killed.

Scooping up $24,000 the four men ran down the steps to the machine and sped away. Just at this moment Hebert W. Haberl, a sophomore at the Carnegie Institute of Technology, came around the corner on the way to the bank to make a deposit, arriving in time to catch a glimpse of the speeding machine and to make a note of the plate number. Rushing back to his home-made radio set, he sent out an emergency. An amateur in Pittsburgh, eight miles away, picked up the message and hastened to his car, drove to the police station where he picked up five detectives and gave the police their first information about the robbery. The pursuers rushed toward Crafton. On the way they met the bandits' car, and recognizing the plate number, they opened fire. The bandits' car was finally wrecked and the money recovered, although the robbers succeeded in escaping.

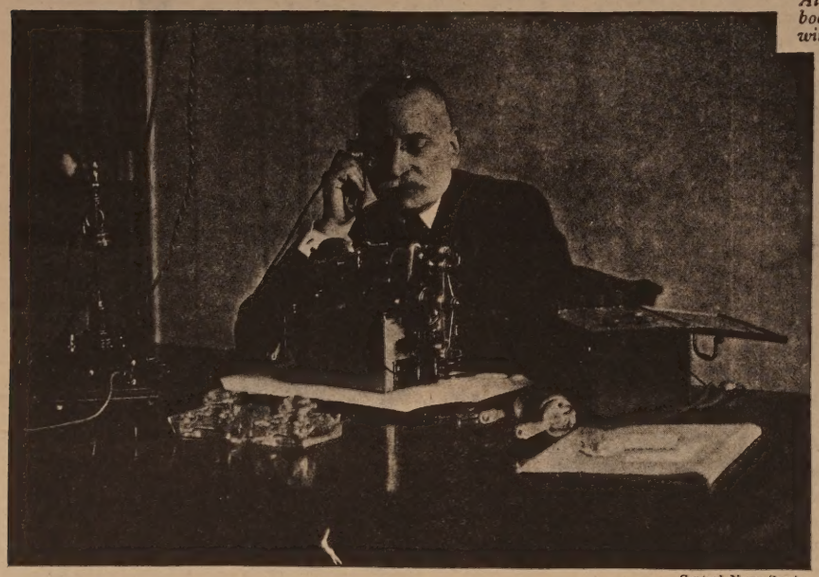
Notwithstanding the big possibilities of radio 'phones for rounding up criminals, it is easy to exaggerate. No one appreciates so well as the experts that the system will have its limitations. This is true of every great invention. Those who know best what a thing can do and why it does it, are the ones most capable of seeing also what it cannot do. One of the most conservative men I have ever talked to about the ultimate speed and uses of the aeroplane is Orville Wright, who invented it. I have not heard of a radio expert who expects the wireless 'phone to supercede the wire 'phone for police communication. But it is certain that broadcasting will be an important adjunct to criminal detecting methods now in use. The cost of reaching hundreds of small villages and outlying country sections by telegraph or ordinary long distance 'phone would be so great as to be prohibitive. By radio the cost is so trifling that it is well worth while to send out bulletins even though only a small percentage of shots hit a mark. And the fact that the radio service used by the police at present is effective augurs what developments will take place.

Kadel & Herbert

WHERE THE OUTGOING POLICE MESSAGES ORIGINATE

At New York police headquarters, where connections are maintained with the po boats especially and where it presumably will be maintained in the not distant fut with the squadron of airplanes that constitute a part of New York's police pat

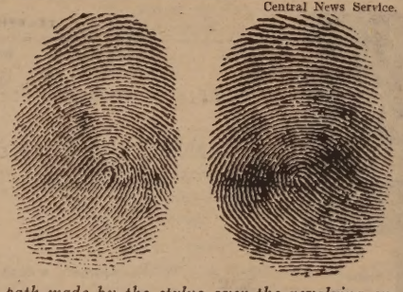
POPULAR RADIO



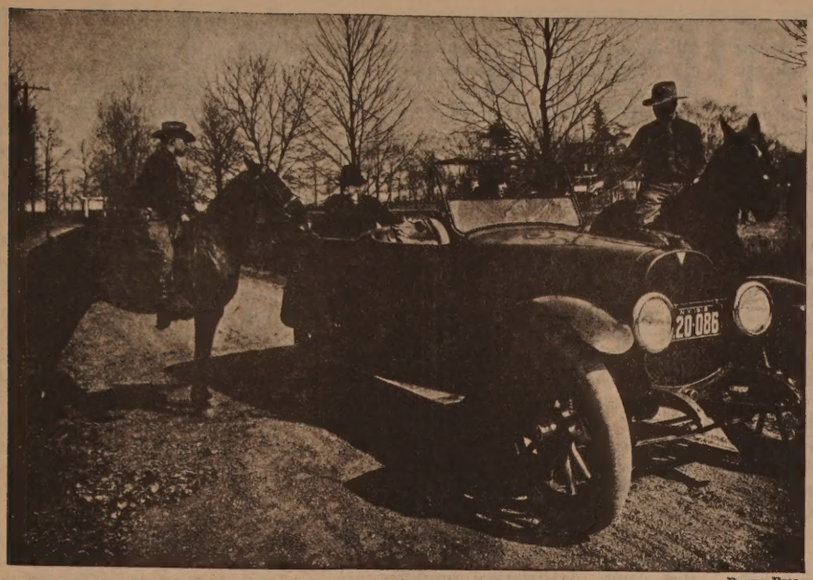
Central News Service.

A MACHINE THAT TRANSMITS FINGER PRINTS BY RADIO

The recent announcement that the Police Department of Lyons, France, has adopted a device for sending portraits of crooks by radio brings into prominence the invention of Edouard Belin, the telestereograph. Belin's apparatus consists of a copper cylinder, not unlike that in one of the early Edison phonographs. This cylinder is made to revolve while at the same time a microphone diaphragm (somewhat resembling the sound box of a phonograph and a recording stylus) passes slowly along it in a lengthwise direction. The picture is placed face downward on the copper cylinder after the latter has been covered with shellac; the cylinder is then placed in hot water so that the paper may be removed while the gelatine film of the print is left on it. Some of the gelatine is dissolved but this dissolution is proportional to the lights and shadows of the picture; because of this fact the picture forms a bas relief upon the cylinder with the darker portions higher than the lighter ones, inasmuch as the darker parts are more resistant to the action of the water. The cylinder is then placed in the machine and the apparatus set in motion. The stylus of the microphone presses against the surface of the picture, covering point by point every part of it, thus causing the microphone diaphragm to vibrate to a greater or less extent, according to the height of any given portion of the bas relief. As this diaphragm is exactly like the transmitter of a telephone except that it is moved by the stylus instead of sound waves, it sends impulses of electricity to the receiving apparatus. The



path made by the stylus over the revolving cylinder is spiral in form. At the end of the wire is the receiving apparatus. This comprises a cylinder which moves at exactly the same rate of speed as that of the sending apparatus, but instead of the metal needle which formed the transmitting stylus or "translator" the stylus here, whose function it is to impress the sensitive film upon the cylinder, is a fine thread of light. The electrical impulses which are sent over the radio or wire from the gelatine film as just described, set in motion an extremely sensitive galvanometer, in which there is a delicate quartz thread bearing a small mirror. This mirror is twisted slightly in one direction or the other in precise accordance with the movements imparted by the stylus to the microphone at the transmitting end. At one side of the mirror is a lamp whose rays are focussed upon it; this pencil of light shifts its position so that it reproduces upon the cylinder the lights and shadows of the original picture.



Brown Bros.

IN THE OUTLYING DISTRICTS THE RADIO WILL BE INVALUABLE TO THE POLICE

Among the State constabulary forces and such far scattered forces as the Northwest Mounted Police of Canada, the radio will eventually be extensively used in the running down of criminals.

International

THE RADIO ON THE TRAIL OF THE CROOK

Every evening at about 8:00 o'clock the chief operator of broadcasting station WGI, Mr. L. D. Trefry, sends out police reports that warn the radio amateurs of New England to be on the lookout for certain fugitives whom the authorities are seeking. The station offers $10.00 to every amateur who assists in making an arrest.

The Electrostatic Field in a Vacuum Tube

By PROF. E. GORDON TAYLOR and JAC. HOHENSTEIN

One of the foundations of the exact science of electricity was laid by Coulomb in 1875 when he announced the famous law, since known as the inverse square law. Prior to his time it was known that forces existed between charges of electricity, but nobody had discovered the factors upon which the forces depended. It remained for Coulomb to show that when the distance between two small charged spheres was halved, then the force of attraction or repulsion due to the charges became four times as large. If now the distance between the charge was reduced to one-third or one-fourth, then the forces increased until they became nine or sixteen times as large as the original force. From this set of measurements Coulomb saw that the force varied inversely as the square of the distance separating the charges.

Again it was found by Coulomb that if the distance between the two charges was kept constant the force between them depended upon the size of the charges of electricity. Combining these two discoveries Coulomb announced the law of force action between electric charges by saying that the force was directly proportional to the product of the charges, and varied inversely as the square of the distance between them. When written in the form of an equation we have:

$$\text{Force} = \frac{Q_1 \times Q_2}{D^2}$$

where Q_1 and Q_2 represent the numerical values of the charges, and D represents the distance between them. For example, if $Q_1 = 9$, and $Q_2 = 4$, and D is 6cm, then the force will be 1 dyne, and represents the force of attraction between the charges. The dyne is the smallest unit of force in the C.G.S. system.

The next step in the development of the science necessitated a definition or method of determining the size of the unit of electricity. This was done very conveniently by considering equal charges on two very small spheres placed one centimeter apart in air. When the charges of electricity were such as to exert a force action of one dyne then they were called unit charges in the Electrostatic System of units. A picture of the unit charge as we conceive of it today would simply consist of an enormous assemblage of electrons on a small sphere.

The fact that at every point in space in the vicinity of a charge of electricity a force would be exerted upon another charge if placed at that point has introduced the idea of an Electric Field. The idea of fields of force is not applied to electric fields alone, but to every region in space where forces exist, such as gravitational field, magnetic field, etc.

Recognition of the existence of such fields, and especially the electric field, has led to experiments dealing with the

strength of intensity of such fields. Having defined the unit of electric charge, it is a relatively simple matter to measure the strength or intensity of an electric field. It is an experimental fact that if different sized charges of electricity are placed in the same electric field then different forces will be exerted upon these different charges. As a result of this fact the strength of the field may be measured in terms of the force which would be exerted upon a unit charge if placed at the point in question. In brief the following relation exists: $E \times 1 = F$, where F represents the force in dynes which would act upon the unit electrostatic charge, and E is the electric field intensity which in this case is equal numerically to F. For example, if the unit charge were placed in an electric field and experienced a force F of 10 dynes acting on it, then the field intensity E would be 10 units. It should be noted that in general the force exerted upon any electrostatic charge of Q units when placed in an electric field of intensity E is given by the relation $F = Q \times E$. If the field intensity E should be 10 units, and the charge $Q = 10$ units were placed at that point, then the force which would act on the charge would be 100 dynes.

From the above discussion it is seen that whenever an electron is found in an electric field it will be acted upon by a force urging it in the direction of the force. Let us take, for example, a two-element tube, such as the 280. When a battery is connected with one end to the filament, and other end to the plate, we have one kind of charge on the filament, and an opposite kind of charge on the plate. Thus there is produced an electric field between these two bodies. If an electron, which we shall always consider as representing a negative charge, is found in that field, it will be acted upon by a force due to this electric field. That force will urge the electron in some direction.

If the positive terminal of the battery is connected to the plate, the charge upon the plate will be positive, and that upon the filament will be negative. The electron will thus be attracted in the direction of the positively charged plate while at the same time it is repelled by the negatively charged filament.

One of the most fundamental factors present in the operation of any vacuum tube is this electric field and the presence of electrons which are caused to move by the action of the field on the electrons.

Electrical Potential

BEFORE we can develop the subject of electricity, certain fundamental definitions or conceptions must be thoroughly understood. Since we conceive of a force as being present at every point in an electric field we can associate with every point the idea of potential. Although the term potential is used by all engaged in electrical work, yet its exact meaning is difficult fully to comprehend. In simple terms we may think of the potential at a point in an electric field as representing some peculiar condition of the medium such as a strain or distortion, which would be caused by electric charges somewhere in the vicinity. While it is difficult to understand the exact meaning and significance of potential, yet the term "difference of potential" carries with it an exact meaning quite easy to visualize. Everybody is familiar with the fact that water will not flow through a pipe unless a difference of pressure exists at the two ends of the pipe. In fact it is the excess of pressure on one surface of the water with respect to the other surface in the pipe which causes the water to flow through the pipe. In exactly the same way we believe that a charge of electricity will not flow from one body to another without something to make it flow. That something, whatever it may be, which causes a charge of electricity to flow from one body to another we call electrical pressure, or excess, or difference of potential. The analogy between electrical pressure, or potential difference, and the hydrostatic pressure causing liquids to flow should be discarded at this point. Hydrostatic pressures are always measured in terms of the magnitude of the force acting on unit area of the free liquid surface, while the difference in electrical pressures is measured in units of work.

In all our future discussion of this subject of potential we are to think of the potential at a point not in terms of pressure, but rather in terms of the work necessary to bring a unit positive charge of electricity from infinity or some great distance to the point in question. With this latter conception of the potential at a point it is very easy to understand what is meant by the term potential difference between two points. While it is quite impossible to measure the work necessary to bring the positive charge from infinity to the point in question, yet it is a relatively simple matter to measure the work necessary to move the charge from one point to another, and thus to get a measure of the difference in potential between the two points. Potential is abstract, but difference in potential is concrete and can be ascertained.

Since difference of potential is measured in terms of work, it is only natural to assume that a unit difference of potential exists when one unit of work is necessary to transfer the unit charge from one point to the other.

The unit of work in the C.G.S. system is the erg. The erg represents the amount of work done when a force of one dyne is moved through a distance of one centimeter.

We can say that unit difference of potential exists between two points such as A and B when one erg of work is necessary to transfer the unit charge from A to B. From our idea of field intensity it is quite evident that if N unit charges are moved through the same difference of potential then the work done on the charges is $N \times 1$ ergs. And if moved through V units of potential the work done will be $N \times V$ ergs.

It should be noted that we are here dealing with the so-called Electrostatic System of Units, which are identical with the units employed in ordinary practice except in the relative sizes of each. In the practical system the unit of

ANTIQUE ELECTRONIC SUPPLY

NEW ITEMS

PARTS FOR CRYSTAL RADIOS

CRYSTAL DETECTOR ASSEMBLY - includes crystal, stand, and Cat's Whisker mounted on board	AE-109	$ 2.25
CRYSTAL HOLDER - stand, arm with Cat's Whisker, screws, nuts. Less crystal	AE-110	1.25
GALENA CRYSTAL - Mounted, lab tested	AE-111	1.00
CAT'S WHISKER -	AE-112	2/1.00

TUBE BOXES

Plain white boxes with dividers to cushion tube. Prices apply to quantities of 25 of a size. Order by size designation.

MIN. SIZE (7/8 x 7/8 x 2 15/16)	$ .11ea
GT SIZE (1 5/16 x 1 5/16 x 3 3/16)	.12
LGT SIZE (1 5/8 x 1 5/8 x 5 5/16)	.13
G SIZE (2 1/16 x 2 1/16 x 6 1/8)	.15

NIPPER DOG

9" Ceramic statue of the famous RCA dog. From Japan. AE-108 11.95

RADIOS AND SPEAKERS

New price list of antique radios and speakers available from us. Send business size, self-addressed, stamped envelope.

CAPACITOR SPECIALS

OLD STYLE TUBULAR CAPACITORS - new old stock

.025 MF.	200 V.	$ .15
.22 MF.	200 V.	.50
.22 MF.	400 V.	.60
.001 MF.	600 V.	.25
.0027 MF.	600 V.	.25
.004 MF.	600 V.	.25
.004 MF.	1600 V.	.40

50% off when ordered in quantities of 10 or more, any one type.

*Some are slightly leaky but make excellent by-pass capacitors.

TUBULAR ELECTROLYTIC CAPACITORS

80 MF.	450 V.	1.90

TUBULAR HIGH VOLTAGE
(for early TV - 10,000 volt tested)

.005 MF.	5000 V.	4.90
.05 MF.	5000 V.	6.90

TUBE SPECIAL

Type 10, 27, and 71A new in individual cartons - $2.00 each in quantities of 5 per type.

Minimum order is $10.00. Add $2.00 handling, plus sufficient shipping on each order.

SEE OUR 16 PAGE CATALOG FOR COMPLETE LISTING OF PARTS AND TUBES

1725 W. University • Suite 2 • Tempe, AZ 85281 • (602) 894-9503

potential difference is called the volt, while the unit of quantity of electricity is called the coulomb. In the Electrostatic System the work involved when Q units of charge are moved through V units of potential difference is equal to $V \times Q$ ergs, while in the practical system the through a difference of potential of V volts is equal to $Q \times V$ joules of work. The joule is a unit of work larger than the erg which is too small for convenient use. The joule is defined as equal to ten million ergs.

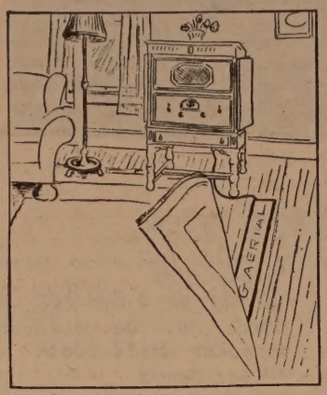
We can now summarize the very important topic of potential difference by saying that when a charge of electricity moves so that it will yield work, then it undergoes a drop in potential. The kind of work which is performed by moving charges of electricity generally is evidenced by the generation of heat, or the production of a magnetic field.

It must be remembered that a negative charge will always move or tend to move from a region of low potential to one of higher positive potential. In a hard vacuum tube of the two element type it is evident that the only things which are in motion are the electrons, and we know they move from filament to plate. Since the plate becomes heated, and heat represents energy, then it must be evident that the electrons have undergone a drop in potential in passing from filament to plate. If positive charges were present in the same type of vacuum tube, then they would move from plate to filament, and they, too, would give out work or heat as a result of a decrease in their energy due to a decrease in their potential energy.

[This lecture delivered on December 13, 1929, at the offices of the National Union Radio Corporation, 400 Madison Ave., New York City.]

!! STOP !!

POTTER RUG AERIAL
Patent Applied For
Adaptable—Simple—Modern

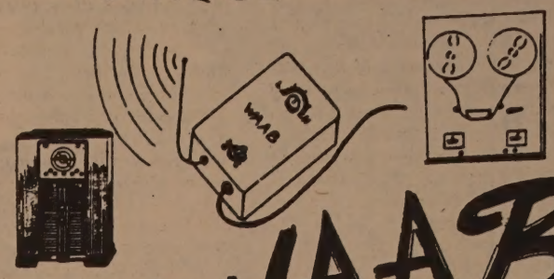


LIST PRICE $1.70
Standard Package, Ten
THE POTTER CO.
North Chicago, Illinois
A National Organization at Your Service

Be a Radio Doctor

Earn $3000-$5000 A YEAR
Be your own boss in work you enjoy
1930

ANTIQUE AUDIO



WAAB the Broadcaster*

- 110 V AC Power
- Meets all FCC regulations for unlicensed broadcast
- Long-wire antenna provided
- Covers standard broadcast band

NOW you can rebroadcast your favorite radio programs through any AM radio with fidelity never before available in any home transmission system. The WAAB is a distortion-free 100 milliwatt transmitter that broadcasts up to 75 feet. Just plug the WAAB cable into the earphone or monitor output of your tape player then tune the radio and the WAAB to a quiet spot on the radio dial. Start the tape machine and you are "ON THE AIR."

99.95 limited time offer

* Wireless Antique Audio Broadcaster

Also -

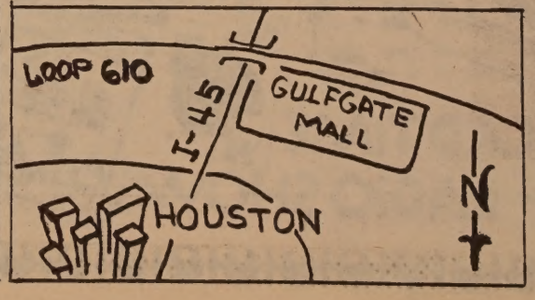
— Speaker field coil rewinding
— Schematic diagrams
— Hard to find tubes & parts
— Radio Restoration Book

713/521-0102
1740 Sunset Blvd. Houston, Texas 77005
Weekdays 9-5, Saturdays by appointment

SAT APRIL 28

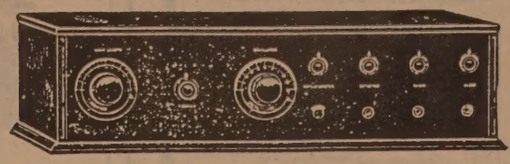
HOUSTON VINTAGE RADIO ASSN.
PROUDLY PRESENTS
THEIR 5th ANNUAL SHOW + AUCTION

GULFGATE SHOPPING MALL I-45 AT LOOP 610 SOUTH
SHOW-9:00-5:00
AUCTION-1:30-5:00



THE OLDE TYME RADIO COMPANY

2445 LYTTONSVILLE ROAD SILVER SPRING MD 20910



NEED HARD TO FIND OLDE TYME RADIO PARTS SUCH AS:

*Vintage Tubes
*AK Style Battery Cable
*OLDE Tyme Hookup Wire
*Brown Silk Type Power Cord
*Audio Transformers
*Power Transformers
*Headphones
*Headphone & Speaker Cords
*Ant., RF, Osc, & IF Coils
*Speaker Grill Cloth
*Pilot Lamps
*Xtal Set Parts

AND MUCH, MUCH MORE. ALSO, AS A CONVENIENCE TO YOU, WE CAN EVEN PROVIDE COPIES OF THOSE EVER POPULAR BOOKS "VINTAGE RADIO" & "FLICK OF THE SWITCH" IN SOFT COVERS. SCHEMATICS OF MANY VINTAGE RADIO AND TV SETS ARE ALSO AVAILABLE. FOR FREE FLYER SEND SASE TO OLDE TYME RADIO COMPANY, 2445 LYTTONSVILLE ROAD, SILVER SPRING, MD 20910.

WISH TO REACH US BY PHONE? THE NUMBER IS 301-585-8776. PLEASE CALL BETWEEN 7:00 and 11:00 PM LOCAL TIME ANY DAY OF THE WEEK.

YOU RECEIVE TWO COUPONS WORTH $1.00 EACH WITH OUR 1984 CATALOG NO. 22!!

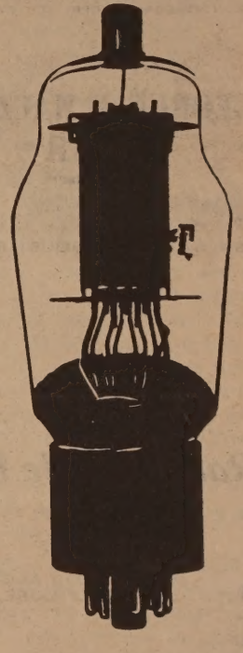
PUETT ELECTRONICS

P.O. BOX 28572 DALLAS TX 75228 MasterCard VISA

THE 1984 ANTIQUE RADIO CATALOG NO. 22 $2.00 POSTPAID

```
**************************************************************
* THE FOLLOWING IS  A COMPUTER BULLETIN  BOARD PRINTOUT  OF AN *
* ACTUAL ACCESS TO  A FORM OF MODERN COMMUNICATION   ABOUT OLD *
* RADIOS AND ANY OTHER EARLY ELECTRONIC OR  SOUND ITEMS        *
**************************************************************

  CONNECTED TO: VRPS BULLETIN BOARD

(ENTER PASSWORD OR PRESS (RETURN) KEY)

 ----) ____
CHECKING PASSWORD...
PLEASE COMPLETE THE REST OF YOUR PHONE:
   --) 214 286 ____
ON-LINE: JIM CRANSHAW

NO MAIL WAITING, SORRY.
========================================
(?=MENU) COMMAND: S

::: SCAN/READ BULLETIN BOARD :::
THERE ARE 22 ACTIVE MESSAGES
START LISTING TITLES WITH #1
1.  KDKA STORY
2.  WANTADS
3.  FROM SYSOP TO ALL
4.  OPERATING TIMES
5.  CHRISTIE'S IN LONDON
6.  TIME IMPLEMENTATION
7.  OPTION G
8.  FOR SALE
9.  WANTADS II
10. WANTADS III
(T)ITLES, (R)EAD
11. T. H. S
12. RE
1

21. VRPS MEETING
22. RADIO POEM
(T)ITLES, (R)EAD, (Q)UIT: 22
MESSAGE #22: RADIO POEM
(SPACEBAR QUITS MESSAGE)
MSG LEFT BY: JIM SARGENT
DATE POSTED: --) FEB 26  4:59:56PM
   **** PSALM OF RADIO ****

RADIO IS MY HOBBY; I SHALL N
OTHER,                    ADS V
IT MAKETH ME STAY
IT LEADETH ME      =Q) READ MSG.# Q
IT DRAW    EAD, (Q)UIT: Q
                ==============================
   MENU) COMMAND: OFF
========================================
 TOTAL CONNECT TIME IS 0 MIN., 81 SEC.
         YOU WERE CALLER #118
         VRPS BULLETIN BOARD
   (A NET-WORKS COMMUNICATIONS SYSTEM)
          PLEASE CALL AGAIN!
========================================
C-1981,ADS                        VER.2.1
THIS AN EXAMPLE OF THE VINTAGE RADIO
AND PHONOGRAPH SOCIETY BULLETIN BOARD,
WHICH IS CONTRIBUTED BY DAVE MEDLEY.
NOW-- HERE IS FINALLY THE TELEPHONE
NUMBER **** (214) 760-0221. *****
```


7,000,000 TUBES



More than 7,000 different types in stock! All unused, tested and fully guaranteed. We have all those precious 'OLDIES' - the tubes you need to get those valued antique receivers back into action.

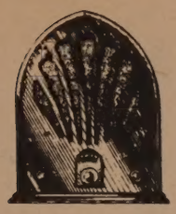
You can buy the specific tube you need from our catalog and/or one of our great assortments of rare old receiving tubes. These include some of the most frequently used tubes of the 20's, 30's, and 40's. Available while they last at these low-low prices.

Golden Oldie Assortment #1: 20 different radio tubes $15.00
Golden Oldie Assortment #2: 35 different radio tubes $25.00

Write today for free catalog and special tube offers!

UNITY ELECTRONICS

P.O. Box 213 • 107 Trumbull Street • Elizabeth, New Jersey 07206 • 201-351-4200 TELEX 139403



ANTIQUE AUDIO
SALES & SERVICE

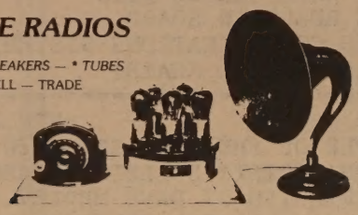
DURELL M. ROTH, PROP.
1740 SUNSET,BLVD.
HOUSTON, TEXAS 77005
(713) 521-0102

VINTAGE RADIOS AND PHONOGRAPHS
MONDAY - FRIDAY
9-5

Kent A. King
5028 Dierker Road
Apartment C-2
Columbus, Ohio 43220

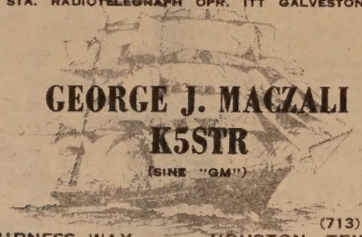
Telephone: 614-459-5360 Antique Radio Collector

VINTAGE RADIOS
• HORNS — • SPEAKERS — • TUBES
BUY — SELL — TRADE



LORNE BURNETT
#502 Park Towers, 9908 - 114 St.
Edmonton, Alberta T5K 1R1 Telephone: (403) 482-2012

QCWA VWOA SOWP RETIRED MARINE SHIP OPR.
COASTAL STA. RADIOTELEGRAPH OPR. ITT GALVESTONRADIO/KLC



GEORGE J. MACZALI
K5STR
(SINE "GM")

4102 DURNESS WAY (713) 664-1570
HOUSTON, TEXAS 77025

TUBES PARTS

Wanted
Old Radios Made Before
1925

E. A. SMITH 2714 ALDEN ROAD
BALTIMORE, MD. 21234

CLASSIFIED

AD SPACE:
Full page.....$65.00
Half page.....$35.00
Quarter page..$20.00
Multiple runs....20% discount

Card size.. $5.00

AD RATE: 10 cents per word
20 cents per word for nonsubscribers
Photo ads: $5.00 extra
DEADLINE: 20TH OF THE PRECEDING MONTH

****

FOR SALE: NEW RADIO TUBES at old prices. Send a large SASE for the DCL (Dirt Cheap List), example 71A's for $3.75. Have Atwater Kent parts plus Bosch and FADA. Custom power supplies made for battery sets, send make and model for quote. Stan Lopes, 1201-74 Monument Blvd., Concord CA 94520.

****

TUBES. UNUSED, IN ORIGINAL cartons. Also filament and power transformers. Write needs, send S.A.S.E., Fala Electronics, Box 04134-13, Milwaukee, WI 53204.

****

OVER 100 RADIO ITEMS FOR SALE/SWAP. SEND LARGE S.A.S.E. OFTEN FOR LIST. (UPDATED WEEKLY) JIM CLARK, 1006 PENDLETON, LANSING, MI 48917..

****

FOR SALE RADIO RIDER MANUALS, VOL. 1 TO 23, T.V. VOL. 1 TO 7. SEND SASE FOR LIST, CLARENCE STEVAHN, BX 576, WISHEK, ND 58495.

****

FOR SALE- CATHEDRAL, BATTERY AND A.C. RADIOS. SEND SASE. J. ALBERT WARREN, BOX 279, WAVERLY, PA 18471.

****

FOR SALE: WESTERN ELECTRIC 215A's tubes. $15.00 each new in sealed box, Lee Williams, 22026 3 pl west, Bothell, WA 98021.

****

SELLING RADIO COLLECTION. Send S.A.S.E. for list of radio magazines and books. D. Harrison, 714 N. Hague Avenue, Columbus, OH 43204. Phone (614) 279-4619. No -- collect calls, please.

****

DX CRYSTAL, ONE TUBE sets, kits, plans, handbooks, coils, supplies. Obsolete tube quotations. Catalog $1.00; none free. Laboratories, 1477-H , Garden Grove, CA 92642.

****

HOMEBREWERS- 1/8" glossy black bakelite panels any size. two 20 cent stamps for sample. BOB, W6ME, 4178 CHASIN STREET, OCEANSIDE, CA 92056. PS, nEED TUNING CONDENSERS FOR NATIONAL SW-5.

****

MOVING SALE: VARIOUS RADIOS AND MISC. FOR SALE. SEND SASE AND YOUR WANT LIST TO GET MY LIST. SETS PRICED TO SELL. KENT KING, 5028 DIERKER, APT. C2, COLUMBUS, OH 43220.

****

TUBES, USED BUT TEST GOOD. Send SASE for list. Diagrams, $1.50. Give make and model number. Tube manual, $5.25 Has information about old tubes and substitution guide, Willis Housel, 3311 S. 54, Lincoln, NE 68506

****

KOLSTER 8C mint $445.00 -- Zenith "Super Series" one door missing, original tubes $165.00 -- Wurlitzer 21000 - looks all original $875.00 -- Solid set of "QST" 41 to 66 v.g. $150.00 -- Stewart Warner 300- mint w/ tubes $125.00 -- 3-T51 GGV, 1100 Motorola 6/12V parts only $50.00 lot. -- 1- Radiola 25 w/ loop - fair condition $145.00 -- Hunter 111C timer $15.00 -- Precise 5" scope $45.00 -- Also must sell quanity of AC consoles, tubes, parts, chassis, schematics, service equipment, etc. Will take in trade, W.E. plus Radiola plus Stromberg Carlsons --- Need W.E. loop and speakers. PILOT "REDI-BLOX" #301, "2#302, 306 and broadcast coils 3#176. Would appreciate "Myers tubes plus phones also. Thank you. John Myers, Box 98, Wilson, NY 14172. (716) 751-6053 evenings.

****

USED TUBES, also unused tubes in original cartons, as used in the 30's, 40's and 50's, Elmer Nelson, 11 S. Church Street, Princeton, IL 61356.

****

RADIO TUBES FROM LATE 1920'S TO EARLY 1930'S. ALL ARE USED AND IN GOOD CONDITION. REASONABLY PRICED SASE FOR LIST. FOTHE, 10 JACKSON STREET, SLOATSBERG, NY 10974.

****

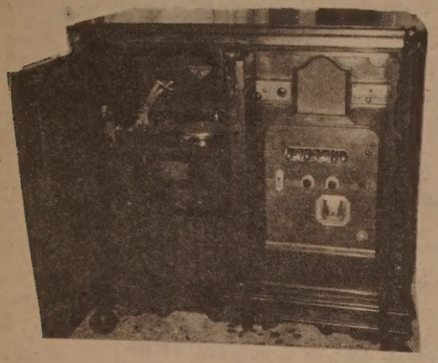
FOR SALE: RCA G-2000 color television console, "The Two Thousand". Sold for $2,000 in 1970, with first RCA solid-state VHF tuning. Rosewood and white lacquer cabinet refinished by RCA, so appearance is superb. Electronically perfect. With remote, technical manual, customer instruction book. Interested parties please telephone Carleton Sarver at (212) 874-3529.

****

AUCTION AUCTION AUCTION The VRPS will hold its annual spring auction at the TPL Building, 519 Lockwood, Richardson, Texas on March 24. Check in starts 4 p.m. auction starts 5:30 p.m. Membership required to participate.

****

****



AVAILABLE: RCA VICTOR MODEL 9-55 ELECTROLA RADIOLA . SOLD FOR $1550.00 IN 1927. RECORD PLAYER, WITH RCA'S FIRST AUTOMATIC CHANGER, AND RADIO WORK. CABINET IS SOLID BLACK WALNUT. SET IS IN MINT CONDITION. WILL CONSIDER SERIOUS CASH AND/OR PARTIAL TRADE OFFERS. SEND $1.00 AND S.A.S.E. FOR PHOTO AND MY CURRENT WANT LIST. JIM CLARK, 1006 PENDLETON, LANSING, MI 48917. (517) 323-9595.

****

PARAGON RA-10, very clean and sharp $585; "Original Vibroplex" all chrome, beautiful, as new $45; Shure Cardioid "Big Bands" Broadcast Mike (not the PA), desk stand $65; Atwater Kent Molded bakelite variometer, nice $35; 1916 vintage Audiotron base-less tubular vacuum tubes; Open filament $50, One good filament $75; Many variables; Consider spark equipment, Pup, RCA 44 Mike, in trade. All plus UPS. SASE. Paul C. Crum, W9LC, 6272 N. Cicero Avenue, Chicago, Illinois 60646 (312) 282-3033.

****

REPAIR SERVICE. I will restore that set (tube type or transistor or auto) like new for cash or I will trade for tubes for my services. No job too small or too big. Experience runs from Philharmonic Scotts to Silvertones, over a 24- year span. SALE. A53-C 1:3 Stancor interstage, new xformers in cartons for $13 ea or 2 for $25. OLD RADIO HOSPITAL; P. O. Box 31555, Houston, TX 77235. After 7:00 p.m., ask for Maury at (713) 723-4254.

****

TUB TESTERS, SIGNAL GENERATORS AM/FM SWEEP, SCOPES, TO ALIGN RADIOS AND BLACK AND WHITE TV. RIDERS RADIO AND TV SERVICE MANUALS. LIST TE4-84 50 CENTS AND LARGE SASE. KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08084.

****

WANTED

WANTED: EARLY BATTERY RADIO PARTS, ALSO JUNKER PANELS/ BASEBOARDS FOR STRIPPING. BROKEN PANELS OK, BUT DO NOT WANT ANY CABINETS. SEND LIST AND PRICES TO: BOB, W6ME, 4178 CHASIN STREET, OCEANSIDE, CA 92056

WANTED: 1 TUBE SETS, CRYSTAL SETS, GREBE CR EQUIPMENT. RAY GARNER, ROUTE 1, BOX 320, BIG SANDY, TN 38221.

ELECTRO- MEDICAL AND QUACK DEVICES, BOOKS WANTED. INTERESTEDD IN FLOOR MODELS ANDS IN DEVICES WITH MULTIPLE KNOBS RESEMBLING RADIOS BUT WHICH ARE NOT RADIOS. I AM ALREADY SATURATED WITH VIOLET RAY DEVICES, SIMPLE 4D BATTERIES. PLEASE DESCRIBE AND PRICE. OLE LINDAN, 1404 DORSH ROAD, CLEVELAND, OH 44121

DETROLA PEEWEE MODEL 219 c. 1939 and MAJESTIC Model 5AK711 c. 1947. Both are small AC/DC plastic sets. J.W.F. Puett, Box 28572, Dallas, TX 75228.

HALLICRAFTERS S-40 SERIES, S-52 and S-77 receivers. Please list condition, appearance, modifications, price. Fala Electronics, Box 04134-13, Milwaukee, WI 53204

PHOTOCOPIES OF ANY LITERATURE ON THE PHILHARMONIC RADIO CORPORATION FROM 1936 TO 1943 AND SERVICE DATA FOR FISHER RADIO RECEIVERS FROM 1946 TO 1949. ALSO, TECHNICAL DATA FOR FISHER MODELS R2 AND TV5. J.W.F. PUETT, BOX 28572, DALLAS, TX 75228.

WANTED PHILCO CATHEDRALS, SERVICE DATA, ADVERTISING, PARTS, ETC. ANYTHING I CAN USE FROM 1930'S. R. J. REINOLD, 260 RIVER ROAD, WINTHROP, MA 02152. (617) 846-0589.

WANTED: INTERNATIONAL KADETTE JR. POCKET RADIO. SEE F.O.S. P. 101. KRIS GIMMY, 1441 NOTTINGHAM, AIKEN, SC 29801

WANTED- SCHEMATIC FOR DeFOREST Interpanel pg. 83 V.R., Tube cover for Radiola 26. Philco model 18 chassis, Case for Federal 110, front panel for Grebe MU-1, Lee Williams, 22026 3 PL West, Bothell, WA 98021.

TUSKA MODEL 225 Any literature or parts (Vintage Radio pg. 121). Will accept complete junk set. Also need box for Radiola IIIA and audio transformer for Magnavox R# model B loudspeaker. Dale Wilson, 401 1st Street, S. W., New Prague, MN 56071 (612) 758-2637.

CASSETTE RECORDING OF General Charles MacArthur's Farewell Address to Congress, Radiola IV, DeForest Audion Detector RJ4, Kennedy 521 amplifier, Kennedy XI, Dave Moore, 3213 Royal Oaks, Pearland, TX 77581, (713) 485-1705.

WANTED: AK DETECTOR #3902 and 2 stage audio amplifier #3634. Joe Watson, 3300 Arrowhead Circle, Round Rock, TX 78664, (512) 255-7962.

NATIONAL SW-3, AC model, 40 meter band spread detector coil. Also same coil for early FB-7. Have several HRO coils for sale or trade. Leland Smith, Route 3, Jasper, AR 72641.

---

*) 1 of 2 march 84
RESTORING ST. JAMES EIGHT TUBE BATTERY SUPER. IF YOU HAVE ONE PLEASE CONTACT ME. NEED MOSTLY INFO, SOME PARTS. ALSO WANT BROWNING DRAKE PARTS. BILL JELINEK, 128 N. STEVENS, RHINELANDER, WI 54501.

---

*) 1 OF 3 MARCH 84
WANTED: WWI SETS, IP501A, ANYTHING WIRLESS SPECIALTY, MURDOCK SPARK ITEMS, COLLINS 4A, 30W, 32, 45A TRANSMITTER, PARTS FOR GREBE CR-5, 9, FEDERAL DX-58, CLAPP EASTHAM R7, HR, H7. RICHARD GROSHONG, 6604 KENT DRIVE NE, CEDAR RAPIDS, IA 52402, (319) 377-3144.

---

*) 1 of 2 march 84
AK 60 KIEL table radio, AK 558 cath., grandfather clock radio, Emerson Mickey Mouse, Philco 51 cath., Philco Jr., Jackson Bell 54 Peter Pan. Jeff Vance, 1819 West Rovey, Phoenix, AZ 85015. Include phone number, price and condition.

MANY ADS ARRIVED LATE FOR THIS MARCH EDITION, SO BE READY FOR THE APRIL EDITION.

======= FIND BULLETIN =========
Jim McGhee of Garland Texas at a auction purchased a blue mirror glass radio, Sparton 557, for the "notorious" price of $4.00 -----
==========

Radiofest '84

The National Conference of The Antique Radio Club Of America

June 21-22-23, 1984
at
The Holiday Inn - Elgin, IL.
345 River Rd.

Featuring...
A Grand Tour of Dr. Ralph Muchow's Fantastic Radio Museum
For Motel Reservations - Contact:
The Holiday Inn - 312-695-5000

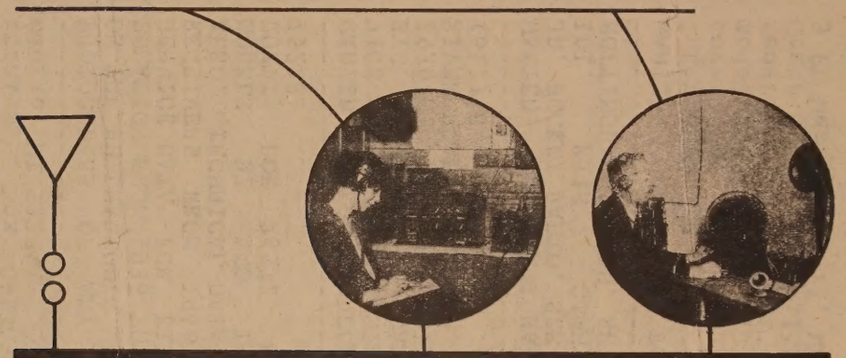
For Convention information - Call or write:
Joe Willis
P.O. Box 14732
Chicago, IL. 60614
312-871-3928

MARCH

THE HORN SPEAKER

1923 RADIO SETS

1984



TYPE OF SET	(F) TUBE SET WITH SINGLE-STAGE AMPLIFIER	(G) REGENERATIVE SET WITH SINGLE-STAGE AMPLIFIER
DISTANCE RANGE	10 TO 30 MILES	30 TO 200 MILES
COST TO INSTALL	$65.00 TO $80.00	$85.00 TO $100.00

(H) REGENERATIVE SET WITH TWO-STAGE AMPLIFIER	(I) TWO-STAGE RADIO-FREQUENCY SET WITH TWO-STAGE AUDIO-AMPLIFIER	(J) THREE-STAGE RADIO-FREQUENCY SET WITH TWO-STAGE AUDIO-AMPLIFIER
	1000 MILES	1000 TO 1500 MILES
	TO $275.00	$275.00 TO $300.00

**5584 *73*
ART B CORBUS
5704 11TH AVE NW
SEATTLE WA -98107